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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/769,968	02/02/2004	Mark S. Miller	21220/04180	9130
24024	7590	05/17/2006	EXAMINER	
CALFEE HALTER & GRISWOLD, LLP			DETSCHER, MARISSA	
800 SUPERIOR AVENUE			ART UNIT	
SUITE 1400			PAPER NUMBER	
CLEVELAND, OH 44114			2877	

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/769,968

Applicant(s)

MILLER ET AL.

Examiner

Marissa J. Detschel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to because all of the drawings contain stray marks and dots randomly scattered throughout the pages, making the drawings informal.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-28 are rejected under 35 U.S.C. 102(a) as being anticipated by Hochstein (USPN 6,603,137).

Regarding claims 1 and 10, Hochstein discloses an apparatus (Figure 1 below) and method of detecting contamination on a window surface of a viewing system, comprising the steps of:

Reflecting light off of contaminants (20) on said window surface (16) via at least one light source (18) (column 3, lines 38-41);

Capturing said reflected light in an image via an imager (12) (column 3, line 66 to column 4, line 7);

Converting said image into image data via said imager (column 4, lines 30-31 and 38-39); and

Processing said image data to detect said contaminants on said window surface via a processor (column 4, line 30-56).

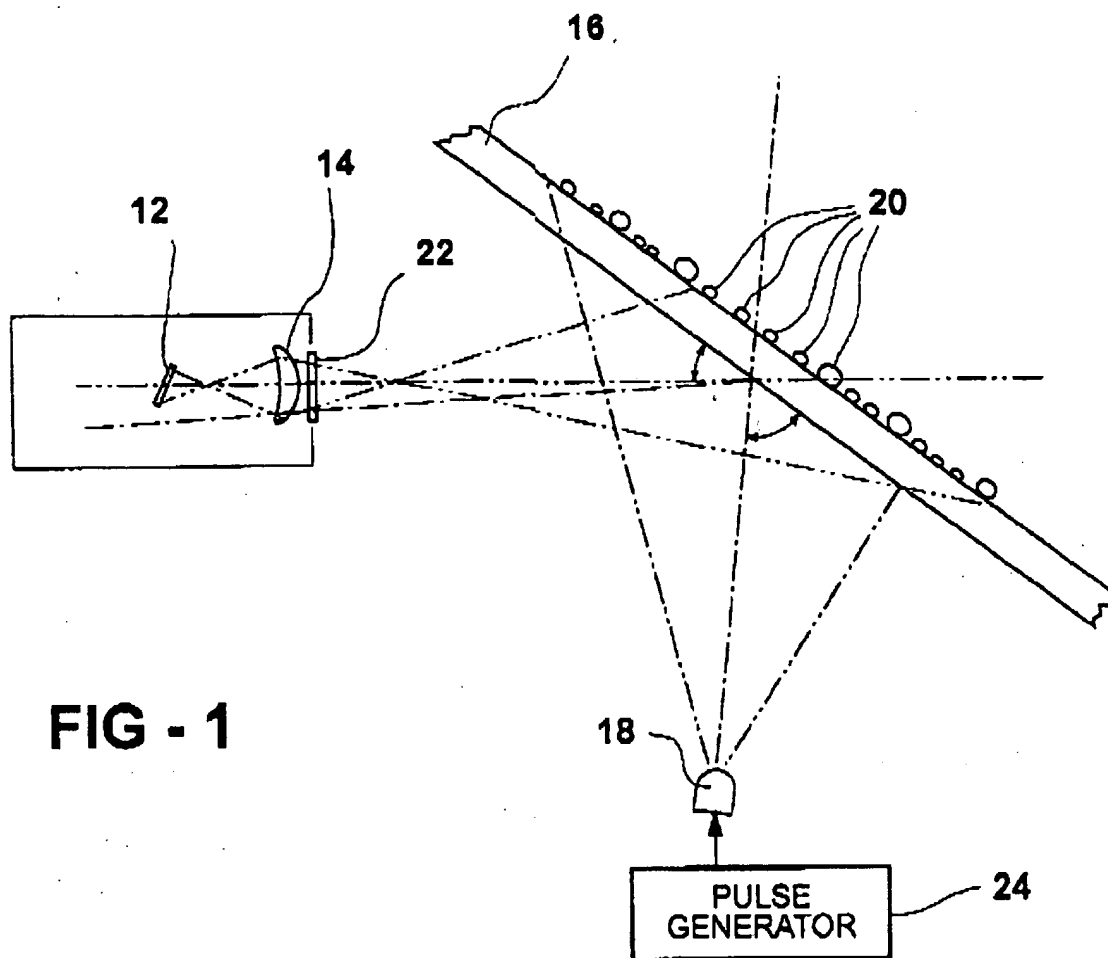
Regarding claim 21, Hochstein discloses a viewing system (Figure 1 below) comprising:

A window (16) for protecting the viewing system from an environment of a scene viewable by the system;

An imager (12) disposed behind said window (16) for capturing images of said scene through a viewing area of said window and for converting said images into image data (column 3, line 66 to column 4, line 7);

At least one light source (18) disposed to inject light edgewise into said window to cause reflections of the injected light off of contaminants on said window surface (column 3, lines 38-41), said imager also for capturing images of said scene including said light reflected from said contaminants (20) (column 3, line 66 to column 4, line 7); and

A processor (26 of Figure 2) for processing both of image data of said scene excluding reflected light from said contaminants, and image data of said scene including reflected light from said contaminants to detect said contaminants on said external surface (column 4, lines 11-23 and 30-56).



In view of the rejections stated thus far, the raindrops (20) detected represent the contamination being detected by the apparatus and method. The light is injected edgewise through the bottom edge of 16, as illustrated in Figure 1 above.

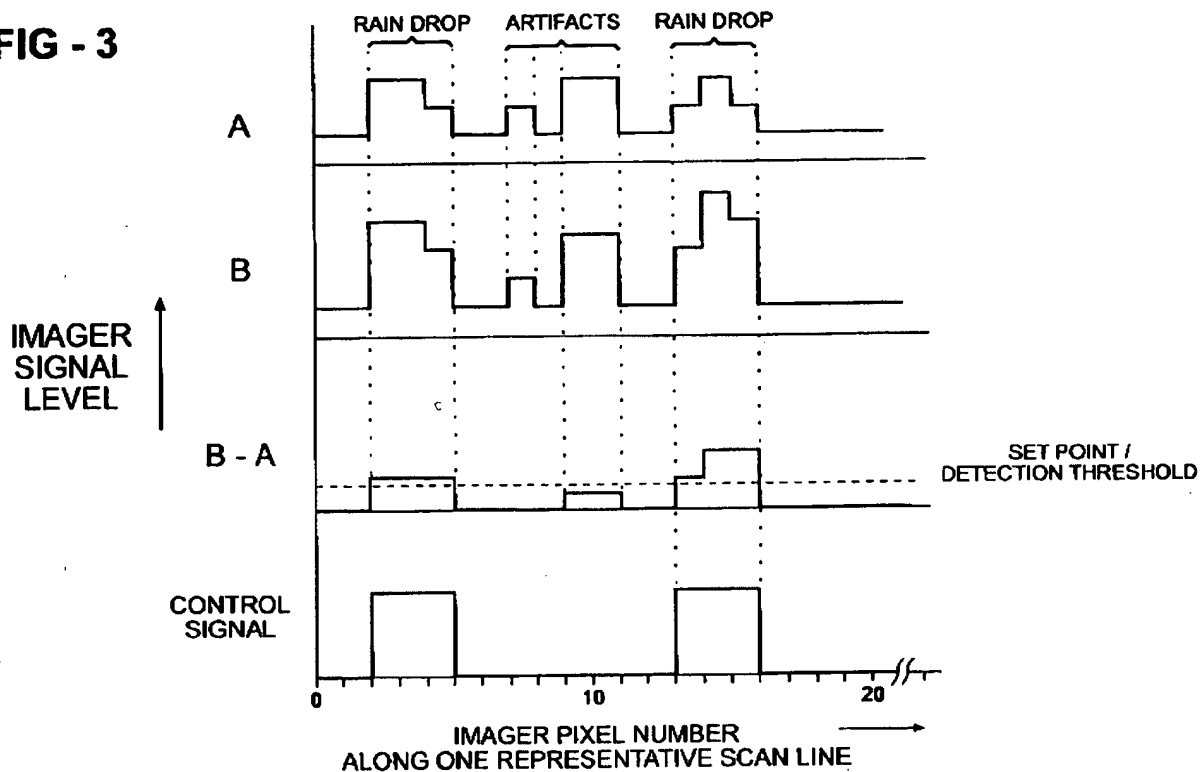
Regarding claims 2 and 13, the step of reflecting in Hochstein's method includes injecting light edgewise into the window along an axis which intersects a viewing area of the window, some of said injected light being passed through the window surface and reflected from contaminants in said viewing area of said surface (column 3, lines 38-41).

In regards to claim 3, the step of reflecting includes reflecting light off of contaminants on an outside surface of the window back through the window and inside surface thereof. (column 6, lines 54-56)

In regards to claim 4, the step of capturing includes capturing the reflected light in an area image comprising a plurality of pixels; and wherein the step of converting includes converting said pixels of the image into electrical data representative of the pixels. The pixels are stored digitally as a series of pixel light intensity values (column 4, lines 30-31 and 38-39).

Regarding claims 5-7, 15, and 23 the step of processing includes compensating said image data for background light in a scene of the viewing system. This is done by capturing a first image excluding reflected light (A) followed by a second image including reflected light (B), and compensating the images by subtracting the data from the first image from the data from the second image (B-A), as indicated in figure 3 below (column 4, lines 11-23 and 30-56).

**FIG - 3**



In regards to claims 8, 10, 12, 16-18, and 24, 26 the compensated image data comprises a multiplicity of light intensity values, and a number of pixel light intensity values (indicated by IMAGER PIXEL NUMBER ALONG ONE REPRESENTATIVE SCAN LINE axis of Figure 3 above) in the compensated image data (B-A) are determined that are greater than a predetermined value (SET POINT/ DETECTION THRESHOLD line of (B-A) of Figure 3) in order to determine if the contaminants on the window surface will affect a scene image of the viewing system (column 4, lines 61-64).

The wipers will be operated in accordance with the threshold value. If the threshold value is over come, indicating the presence of raindrops in the scene image of the viewing system, the wipers will operate to remove these raindrops. Therefore, the



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raindrops (contaminants) affected a scene image in the viewing system enough to cause the windshield wipers to operate. The operation of the wipers represents a cleaning off of the raindrops. If this threshold is not breached, and no raindrops are present, the wipers won't operate in reference to that particular scene image. In other words, the system disregards the scene image in that particular case,

In regards to claims 9 and 27, the first and second images are captured within a short time interval of each other (column 4, lines 18-24). The light source used in the device is pulsed, and for every pulse cycle, an image is captured for the fully illuminated setting with the pulsed light on and a second subsequent image is captured representing the ambient light when the illumination of the pulsed light is off. These two images are the images (A and B) that are subtracted from each other. Lights pulse at very quick speeds, so the time interval between these two images would be short.

Regarding claim 14, the imager of Hochstein is disposed behind the window to capture light reflected from the contaminants back through the window and internal surface thereof (see Figure 1 above) (column 6, lines 54-56).

In regards to claim 19, the light source comprises a light emitting diode (column 3, lines 49-51).

In regards to claim 20, the imager comprises a charge coupled device (column 5, lines 10-13).

Regarding claim 22, the processor of Hochstein is operative to control an on and off operation of said at least one light source. The synchronizer (32) of the processor

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(26 of Figure 2) controls the pulsing of the light source to create the on and off of the pulsed light as disclosed above. (column 4, lines 17-23)

In regards to claim 28, the viewing system includes a digitizer for converting image data from the imager into digital image data; and wherein the processor comprises a digital signal processor for processing the digital image data in accordance with a programmed algorithm. The image data is digitized (column 4, lines 30-31 and 38-39) and stored, as disclosed above. This involves the use of a programmed algorithm to create the digitized intensity values.

### ***Conclusion***

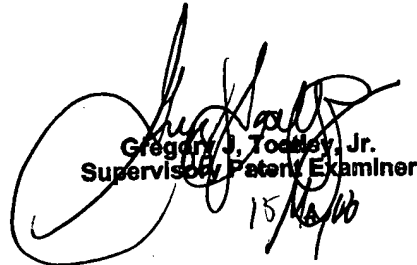
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marissa J. Detschel whose telephone number is 571-272-2716. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Marissa J Detschel  
May 10, 2006  
MJD

  
Gregory J. Tooley, Jr.  
Supervisory Patent Examiner  
15 May 10